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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,035	11/30/2001	Yury Kamen	16159/022001; P6423	5998
32615	7590	08/27/2004	EXAMINER	
OSHA & MAY L.L.P./SUN 1221 MCKINNEY, SUITE 2800 HOUSTON, TX 77010			STEELMAN, MARY J	
			ART UNIT	PAPER NUMBER

2122

DATE MAILED: 08/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/998,035

**Applicant(s)**

KAMEN ET AL.

**Examiner**

Mary J. Steelman

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11/30/01, 1/29/02.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) ✓
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/30/2001. ✓

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. Claims 1-27 are pending.

#### *Information Disclosure Statement*

2. IDS received 11/30/201 has been considered.

#### *Drawings*

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

FIGURE 3, #45 & # 50 are missing a description in the Specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the

specification to add the reference character(s) in the description in compliance with 37 CFR

1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

#### *Specification*

4. Applicant is requested to fill in the blanks on page 1 of the Specification.

#### *Claim Rejections - 35 USC § 102*

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

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subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, 4-10, 13-22, and 25-27 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,321,240 B1 to Chilimbi et al.

Per claim 1:

A method for transparently optimizing data access, comprising:

(Abstract, lines 1-3, "Fields which are individually addressable data elements in data structures are reordered to improve the efficiency (optimizing)...", col. 1, lines 12-15, "This invention relates generally to the field of computer memory management and in particular to optimizing cache utilization by modifying data structures.", col. 20, lines 11-30, "...method..., col. 19, line 66- col. 20, line 1, "...technique reduces cache miss rates...and improves program performance...as compared to the commonly used alternative." )

-gathering information related to data usage when a system is processing;

(Col. 2, lines 37-38, "The partitioning is based on profile information about field access counts (data usage)", col. 16, lines 63-66, "The design and implementation of a low-overhead, real-time data access (data usage) profiler..." )

-determining a usage pattern of the system using gathered information.

(Col. 2, lines 37-38, "The partitioning is based on profile information (gathered usage patterns) about field access accounts." )

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Per claim 2:

-pre-fetching data determined by the usage pattern of the system;

(Col. 13, lines 18-20, "Clustering improves spatial and temporal locality and provides implicit prefetching.")

-caching data locally;

(See FIGS. 12A & 12B: copying objects into empty space in a cache, col. 13, lines 13-15, "Clustering places structure elements likely to be accessed contemporaneously in the same cache block.")

-accessing data by the system;

(Col. 10, lines 1-2, "...makes the recommended changes (access data by the system) and then run the resulting application.")

-synchronizing cached data with persistent data.

(Col. 15, lines 13-15, "...garbage collection routine is used to remove objects from cache lines that have not been accessed for some time and are no longer required by active threads of program execution." Garbage collection retains persistent data and deletes stale data, thus synchronizing.)

Per claim 4:

-generating tests for the system by retaining the usage pattern over a period of at least one

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execution of the system.

(Col. 10, lines 7-17, "...while running the application...a data element...is tracked...A constraint on reordering this element may then be associated with that data element during a second run...(using retained usage patterns)")

Per claim 5:

-usage pattern comprises pieces of information used together based on a relationship.

(Col. 4, lines 7-9, "...division of a class into two classes comprising hot access fields and cold access fields with an added level of indirection to the class containing cold access fields..."

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Information gathered into hot classes have the relationship of being frequently accessed.)

Per claim 6:

-the relationship is temporal.

(Col. 6, lines 30-37, "This results in a high temporal access affinity...", col. 6. line 50, "...derive desired temporal affinities.")

Per claim 7:

-the relationship is causal.

(Col 6, lines 51-54, "A trace may also be used to collect temporally correlated reference data (causal relationship) if desired by tracing all memory references and using a sliding time window to identify references to each other...")

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Per claim 8:

-deriving an initial usage pattern from application code analysis.

(Col. 6, lines 60-65, "Static program analysis (initial usage patterns)...Such analysis can range from...tools written to analyze program data structure usage.", col. 10, lines 18-19, "...statically analyzing...")

Per claim 9:

-deriving an initial usage pattern from an empty set.

(Col. 6, lines 66-67, "A field affinity graph is constructed by bbcache as shown in FIG. 3." An empty set is used for the first profiling.)

Per claim 10:

-deriving an initial usage pattern from a specification.

(Col. 10, lines 7-17, "...A constraint on reordering this element may then be associated with that data element during a second run through the layout process (specification)...")

Per claim 13:

A method for transparently optimizing data access, comprising:

- gathering information related to data usage when a system is processing;
- determining a usage pattern of the system using gathered information;
- pre-fetching data determined by the usage pattern of the system;
- caching data locally;



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-accessing data by the system;

-synchronizing cached data with persistent data.

(See limitations addressed in the rejection of claims 1 & 2 above.)

Per claim 14:

A method for transparently optimizing a distributed application having a client-side and a server-side, comprising:

(Col. 5, lines 19-23, "Personal computer may operate in a networked environment...Remote computer may be...a server, a router...", col. 5, lines 29-31, "Such networking environments are commonplace in offices, enterprise-wide computer networks...")

-gathering information related to data usage on the client-side when the distributed application is processing;

-determining a usage pattern using gathered information.

(Chilimbi suggests that his invention is suitable for a business environment. The limitations for gathering information related to data usage and determining a usage pattern are addressed in claim 1 above.)

Per claim 15:

-pre-fetching data from the server-side;

-caching data on the client-side;

-accessing data on the client-side;

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-synchronizing cached data on the client-side with persistent data on the server-side.

(See limitations addressed in the rejection of claim 2 above.)

Per claim 16:

-the usage pattern comprises pieces of information used together based on a relationship.

(See limitations addressed in the rejection of claim 5 above.)

Per claim 17:

-the relationship is temporal.

(See limitations addressed in the rejection of claim 6 above.)

Per claim 18:

-the relationship is causal.

(See limitations addressed in the rejection of claim 7 above.)

Per claim 19:

-the data represents objects.

(Col. 5, lines 60-62, "The notion of an object is exploited in the present invention in that certain aspects of the invention are implemented as objects in one embodiment.", col. 17, lines 8-9,

"Profiling can be implemented at object, not filed, granularity.")

Per claim 20:

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-deriving an initial usage pattern from application code analysis.

(See limitations addressed in the rejection of claim 8 above.)

Per claim 21:

-deriving an initial usage pattern from an empty set.

(See limitations addressed in the rejection of claim 9 above.)

Per claim 22:

-deriving an initial usage pattern from a specification.

(See limitations addressed in the rejection of claim 10 above.)

Per claim 25:

A method for transparently optimizing a distributed application having a client-side and a server-side, comprising:

-gathering information related to data usage on the client-side when the distributed application is processing;

-determining a usage pattern using gathered information;

-pre-fetching data from the server-side;

-caching data on the client-side;

-accessing data on the client-side;

-synchronizing cached data on the client-side with persistent data on the server-side.

(See limitations addressed in the rejection of claims 14 and 15 above.)

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Per claim 26:

A computer-readable medium having recorded thereon instructions executable by processing, the instructions for:

(Col. 20, lines 31-54, "...computer readable medium...")

- gathering information related to data usage when a system is processing;
- determining a usage pattern of the system using gathered information;
- pre-fetching data determined by the usage pattern of the system;
- caching data locally;
- accessing data by the system;
- synchronizing cached data with persistent data.

(See limitations addressed in the rejection of claims 1 and 2 above.)

Per claim 27:

An apparatus for transparently optimizing data access, comprising:

(Col. 20, lines 55-67, "A computer system (apparatus)...")

- means for gathering information related to data usage when a system is processing;
- means for determining a usage pattern of the system using gathered information;
- means for pre-fetching data determined by the usage pattern of the system;
- means for caching data locally;
- means for accessing data by the system;
- means for synchronizing cached data with persistent data.

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(See limitations addressed in the rejection of claims 1 and 2 above.)

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,321,240 B1 to Chilimbi et al., in view of US Patent 6,700,590 B1 to DeMesa et al.

Per claim 3:

Chilimbi disclosed (col. 10, lines 7-17), “by retaining the usage pattern over a period of at least one execution of the system”. The application is tracked while running, resulting in a new layout and the application is run again.

Although Chilimbi disclosed that his invention was suitable for a business process (col. 5, lines 19-31), “Such networking environments are commonplace in offices, enterprise-wide computer networks...”, he failed to disclose “generating a description of a business process model”. However, DeMesa disclosed (col. 2, lines 21-34), a view model to collect and display data from multiple sources. “The data that is collected and displayed by the system may, for example, include...time series data. The system also preferably includes development tools...and views to generate a model of a business entity.

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Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the invention, to modify the Chilimbi invention to include the generation of a business entity, as Chilimbi did disclose that his invention was suitable for a business environment, and generating business models is a typical use of information gathered from profiling.

8. Claims 11, 12, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over 6,321,240 B1 to Chilimbi et al., in view of US Patent 6,430,741 B1 to Mattson, Jr. et al.

Per claims 11, 12, 23, and 24:

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Chilimbi disclosed a technique for optimizing data access in a system, gathering a usage pattern. Chilimbi failed to disclose “displaying the usage pattern to a display device” or “generating documentation from the usage pattern.”

However, Mattson disclosed a system and method for data coverage (optimizing data access) analysis, including display and documentation. Col. 3, lines 31-36, “...coverage information is read from the merged file using a visualization tool which displays the number of times each element in the data table has been accessed...”, col. 6, lines 31-33, “The coverage information is then fed to the visualization tool which produces a visually demonstrative display of the coverage information.”, col. 7, lines 59-63, “...data coverage tables are created to store information relating to data coverage...termination code is added to the program. The termination code writes the coverage information to a file for later examination (documentation).”

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Therefore, it would have been obvious, to one of ordinary skill in the art, at the time of the invention, to have included the display and documentation features in the Chilimbi invention, as they are logical, well known techniques for providing information gathered from profiling and presenting the information to a developer.

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary Steelman, whose telephone number is (703) 305-4564. The examiner can normally be reached Monday through Thursday, from 7:00 AM to 5:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Dam can be reached on (703) 305-4552. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mary Steelman



08/18/2004



**ANTONY NGUYEN-BA  
PRIMARY EXAMINER**